

REMARKS

Entry of the foregoing amendments and reconsideration of this application is respectfully requested. By this amendment, claims 1 and 28 have been amended to more specifically set forth the invention. Also, new claims 37 through 51 have been added to provide the applicant with adequate coverage of the invention. No additional fee is required for these claims since applicant initially paid for 36 claims and five independent claims. Claims 1-7, 28-33, and 37-51 remain in the application.

Objections to the drawings

The Examiner objected to the mention of element 91 in the specification, page 6, line 1 and not including the number in FIG. 1. The Examiner also objected to showing number 94 in FIG. 1 and not mentioning it on page 6. Applicant has amended the specification at pages 5 and 6 to explain that recessed regions 76 and 93 are better illustrated in the cross-sectional view of FIG. 10. Applicant believes that including the numbers 76 and 93 in FIG. 1 could be misleading. Also, the specification has been amended to include number 94 on page 6. Since this number was included in the description of FIG. 10 on page 19, none of this is new matter. Applicant believes this

amendment now clarifies the description and overcomes the objection.

35 U.S.C. 102(b) REJECTIONS

Claims 1 thru 3 and 5 thru 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Kendall, U.S.P. 3,881,244. Applicant believes that the amendment to claim 1 overcomes this rejection.

Claim 1 now specifies "a trench defined in the dielectric region and including dielectric sidewalls, and an adjacent cavity defined at least partially by the substrate". Claim 1 further specifies "electroplated conductive material disposed within the trench". Here it will be understood by those skilled in the art that electroplated conductive material is a specific type of material. This does not describe a method of disposing the material. Electroplated material is different than, for example, material deposited by sputtering or any of the various well-known chemical depositions. Thus, anyone skilled in the art will immediately understand that the electroplated conductive material disposed within the trench in the present invention is substantially different than anything disclosed by Kendall.

Also, claim 1 now specifies "the sides of the inductance being bounded by the dielectric sidewalls and the cavity being adjacent the bottom." Clearly, anything in Kendall that could be interpreted as a trench with dielectric sidewalls does not bound his inductance. Kendall's inductance includes studs 9 and metal interconnects 17, none of which are even close to a trench sidewall. Thus, it is clear that nothing in Kendall's device or teaching is in any way similar to the present invention as now stated in claim 1. Therefore, Kendall does not anticipate the invention in claims 1 thru 3 and 5 thru 7. Further, since Kendall does not teach any structure or concept that is even remotely similar to the structure of claim 1, applicant believes that claims 1 thru 3 and 5 thru 7 are now in condition for allowance.

Claims 1, 2, 6, 28, 30, and 33 are rejected under 35 U.S.C. 102(b) as being anticipated by Lee et al., U.S.P. 6,030,877. Applicant believes that the amendment to claim 1 overcomes this rejection.

As stated above, claim 1 now specifies "a trench defined in the dielectric region and including dielectric sidewalls, and an adjacent cavity defined at least partially by the substrate". Claim 1 further specifies "electroplated conductive material disposed within the trench". Claim 28

specifies "a first inductor of electroplated conductive material" and "a bottom of the inductor being positioned adjacent the cavity". It will be understood by those skilled in the art that electroplated conductive material is a specific type of material and is substantially different than the electroless plated material described by Lee et al. '877. Further, nothing in the structure or teaching of Lee et al. '877 suggests a cavity adjacent the bottom of the inductor, as now specified in claims 1 and 28. Anyone skilled in the art will immediately understand the difference between a cavity underneath a conductor and the silicon oxide described by Lee et al. '877. The cavity will have a dielectric constant of about 1.0 while silicon oxide (or dioxide) has a dielectric constant of about 3.8. Even the sidewalls described by applicant have a dielectric constant different than the sidewalls of Lee et al. '877.

Thus, it is clear that nothing in the devices or teaching of Lee et al. '877 is in any way similar to the present invention as now stated in claims 1 and 28. Therefore, Lee et al. '877 does not anticipate the invention in claims 1, 2, 6, 28, 30, and 33. Further, since Lee et al. '877 does not teach any structure or concept that is even remotely similar to the structure of claims 1 and 28, applicant believes that claims 1, 2, 6, 28, 30, and 33 are now in condition for allowance.

Claims 1, 2, 6, 28, and 30 thru 33 are rejected under 35 U.S.C. 102(b) as being anticipated by Lee et al., U.S.P. 6,093,599. Applicant believes that the amendment to claim 1 overcomes this rejection.

As stated above, claim 1 now specifies "a trench defined in the dielectric region and including dielectric sidewalls, and an adjacent cavity defined at least partially by the substrate". Claim 1 further specifies "electroplated conductive material disposed within the trench". Claim 28 also specifies "a first inductor of electroplated conductive material formed within a trench defined by the dielectric region". It will be understood by those skilled in the art that electroplated conductive material is a specific type of material and is substantially different than the material described by Lee et al. '599, which is deposited by sputtering or any of the various well-known chemical depositions and patterned.

Further, Lee et al. '599 does not include his inductance in a trench to surround his inductance with low dielectric constant material. Anyone skilled in the art will immediately understand the difference between an electroplated conductive material disposed within a trench and material that is deposited and etched to form a conductor as described by Lee et al. '599.

Thus, it is clear that nothing in the devices or teaching of Lee et al. '599 is in any way similar to the present invention as now stated in claims 1 and 28. Therefore, Lee et al. '599 does not anticipate the invention in claims 1, 2, 6, 28, and 30 thru 33. Further, since Lee et al. '599 does not teach any structure or concept that is even remotely similar to the structure of claims 1 and 28, applicant believes that claims 1, 2, 6, 28, 30, and 33 are now in condition for allowance.

35 U.S.C. 103(a) REJECTIONS

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kendall as applied to claims 1-3 and 5-7 above, and further in view of Matsuzaki, JPO 06-120036. Applicant believes that the amendment to claim 1 overcomes this rejection.

For all of the reasons stated above, the structure and teaching of Kendall is not similar to applicant's claimed structure. Applicant does not believe that the addition of copper, as suggested by Matsuzaki, will overcome the deficiencies (with respect to the presently claimed invention) of Kendall's teaching. In fact, inductances of the type disclosed by Matsuzaki are the low quality factor (Q) prior art devices specifically mentioned by applicant in

his Background of the Invention, pages 1 and 2 of the present specification. Therefore, applicant believes that claim 4 is not obvious in view of any proper combination of Kendall and Matsuzaki.

Claims 28 thru 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wen et al., U.S.P. 6,083,802 in view of Kendall. Applicant believes that the amendment to claim 1 overcomes this rejection.

The structure and teaching of Wen et al. has all of the shortcomings of Kendall, discussed at length above. For example, claim 28 specifies "a bottom of the inductor being positioned adjacent the cavity". The inductor of Wen et al. does not describe a cavity anywhere. Also, inductor portions 20 of Wen et al. are deposited by a conventional metallization process and are "composed of a conventional metallic material, such as copper, for forming contacts in a metallization process (Wen et al. specification, column 3, lines 5-15). Metallization processes in the integrated circuit art, as will be understood by anyone skilled in the art, produce substantially different material than the electroplated conductive material presently claimed.

Clearly, Wen et al. disclose an inductor that is similar in all respects to the inductor of Kendall and,

therefore, the teaching of Wen et al. does nothing to overcome the deficiencies (with respect to the presently claimed invention) in the teaching of Kendall. Thus, applicant believes that claims 28 thru 33 are now in condition for allowance.

NEW CLAIMS

New claims 37 thru 51 have been added to the application to provide applicant with more thorough coverage of the invention. All of these claims differentiate the invention from the cited prior art in ways similar to those discussed in detail above. Applicant believes that all of these claims simply describe the invention in terms that clearly point out to those skilled in the art how the invention overcomes the problems prevalent in the prior art. As such, applicant believes that all of these claims, 37 thru 51, are clearly different than any of the cited references and in condition for allowance

SUMMARY

Since none of the applied references, individually or in any proper combination, disclose an integrated circuit similar to applicant's claimed structure and since none of the applied references can achieve the functions of the present invention, applicant believes that claims 1-7, 28-33, and 37-51 are now in condition for allowance.

Should there be any questions or remaining issues regarding the foregoing, Examiner is cordially invited to telephone the undersigned attorney for a speedy resolution.

Respectfully requested,

A handwritten signature in cursive script, appearing to read "Robert A. Parsons".

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